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Standard Surface Grinder for Precision Machining of Thin-Wall Tubing

The problem:

To devise a low cost method for precision machining of thin-wall stainless steel tubing. Conventional machining methods caused excessive tubing distortion, resulting in additional straightening and deburring operations.

The solution:

Adapt a standard 40-inch Model B Thompson Surface Grinder to perform the machining operation by electrical discharge grinding.

How it's done:

Strips of micarta are used to insulate the headstock of the surface grinder from the machine frame. The grinding wheel drive is replaced with a constant torque, variable speed, (0 to 65 rpm) direct current motor. The grinding wheel is replaced with a step-dressed graphite wheel electrode (12 inch dia. x 2 inches thick). Electrical energy is supplied by a standard 60 ampere power unit. Liquid dielectric, filtered automatically through a diatomaceous earth media, is used for cooling during the grinding operation.

In one pass, a number of parts are rough machined simultaneously. The wheel electrode is then re-dressed with a form-type high speed steel dressing tool, and a finish pass concludes the machining. A hydraulic servovalve and hydraulic motor are used to drive the machine table. Erratic motion experienced in the reciprocating table at the slow speed in cutting is elimi-

nated by additional forced lubrication of the bearing ways. A related adaptation, a traveling wire electrode fixture, is used for machining slots in thin-walled tubing.

Note:

Inquiries concerning this innovation may be directed to:

Office of Industrial Cooperation
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Reference: B67-10400

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Patent status:

Inquiries about obtaining rights for commercial use of this innovation may be made to:

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